

Claim 1 (original): Method for producing laser-induced holograms inside transparent materials by using laser-induced damages comprising:

- calculation of an interference pattern, corresponding to a given object;
- transformation of the said interference pattern into arrangement of points so that laser-induced damages created at these points are able to reconstruct a high quality holographic image;
- generating and focusing laser radiation at the points of the transparent material corresponding to the points of the said arrangement so that the marks generated as a result of the interaction of laser radiation with the material are created.

Claim 2 (canceled)

Claim 3 (currently amended): The method in accordance with claim 1 ~~including~~ further comprising creation of an arrangement of laser-induced damages, which being illuminated, reconstruct the holographic image of the ~~given~~ object.

Claim 4 (currently amended): The method in accordance with claim 1 ~~including~~ further comprising the transformation of the interference pattern into damage arrangement by the division of the transparent material area into several regions and production of laser-induced damages inside these regions so that ~~this~~ said damages approximate the interference pattern.

Claim 5 (currently amended): The method in accordance with claim 1 ~~including~~ further comprising creation of an arrangement of laser-induced damages wherein the coordinates of points, at which the breakdowns should be produced, are determined as a result of $[[n]]$ independent trials with possible outcomes described by probability density function, which is proportional to the intensity of corresponding interference pattern.

Claims 6-8 (canceled)

Claim 9 (original): Method for production of small laser-induced damages by controlling and transforming wavelength of laser radiation generating breakdowns at the predetermined points of transparent materials, comprising:

- determination of functional dependence of damage sizes from sizes of focal point for given transparent material;
- determination of focal point sizes corresponding to damage sizes;
- transformation of laser radiation so that it has the wavelength corresponding to demanded damage sizes;
- generating laser radiation of determined wavelength and focusing the transformed laser radiation at the predetermined points of transparent material to generate laser-induced breakdowns.

Claims 10-12 (canceled)

Claim 13 (New): The method in accordance with claim 1 including creation of combined arrangement of laser-induced damages, which provide both reproduction of laser-induced images and reconstruction of laser-induced holograms inside transparent materials.

Claim 14 (New): The method in accordance with claim 13 further comprising production of an interference pattern on at least one side of a transparent material containing a laser-induced image.

Claim 15 (New): The method in accordance with claim 13 further comprising production of iridescent background by creating an arrangement of the damages corresponding to a diffraction grating or an iridescent hologram.

Claim 16 (New): Laser-computer system for production of laser-induced holograms comprising:

- a first computer system for calculation of interference pattern, corresponding given object;

- a second computer system for transformation of the said interference pattern into arrangement of points, so that laser-induced damages, created at these points, are able to reconstruct high quality holographic image without internal split of transparent material;
- laser system for generating laser radiation to create laser-induced damages of demanded sizes;
- optical and moving systems for focusing laser radiation at the predetermined points of the transparent material to produce the breakdowns at these points.

Claim 17 (New): The controlling system which in accordance with claim 16, controls a laser system for generating radiation with the wave length corresponding to the needed sizes of laser-induced damages.

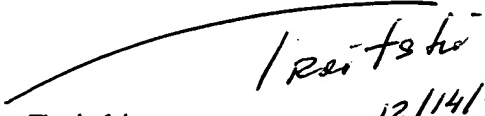
Claim 18 (New): The system of claim 16 wherein the laser system generates a harmonic of the fundamental wavelength produced by the laser and transforms of the said radiation into the second (or high) harmonic to create laser-induced damages inside the transparent material.

Claim 19 (New): The laser system in accordance with claim 18 further comprising a diode-pumped Nd-YAG laser generating radiation for creating laser-induced marks inside transparent materials.

Summary

Applicant asserts that new claims 13 - 19 as well as the original and currently amended claims 1, 3-5 and 9 are in a condition for allowance and respectfully requests a notice as to the same.

Respectfully submitted,


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